



NSAI
Standards

Irish Standard
I.S. EN IEC 60664-1:2020

Insulation coordination for equipment within low-voltage supply systems - Part 1: Principles, requirements and tests

I.S. EN IEC 60664-1:2020

Incorporating amendments/corrigenda/National Annexes issued since publication:

The National Standards Authority of Ireland (NSAI) produces the following categories of formal documents:

I.S. xxx: Irish Standard — national specification based on the consensus of an expert panel and subject to public consultation.

S.R. xxx: Standard Recommendation — recommendation based on the consensus of an expert panel and subject to public consultation.

SWiFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

This document replaces/revises/consolidates the NSAI adoption of the document(s) indicated on the CEN/CENELEC cover/Foreword and the following National document(s):

NOTE: The date of any NSAI previous adoption may not match the date of its original CEN/CENELEC document.

This document is based on:

EN IEC 60664-1:2020

Published:

2020-07-24

This document was published under the authority of the NSAI and comes into effect on:

2020-08-10

ICS number:

29.080.30

NOTE: If blank see CEN/CENELEC cover page

NSAI
1 Swift Square,
Northwood, Santry
Dublin 9

T +353 1 807 3800
F +353 1 807 3838
E standards@nsai.ie
W NSAI.ie

Sales:
T +353 1 857 6730
F +353 1 857 6729
W standards.ie

Údarás um Chaighdeáin Náisiúnta na hÉireann

National Foreword

I.S. EN IEC 60664-1:2020 is the adopted Irish version of the European Document EN IEC 60664-1:2020, Insulation coordination for equipment within low-voltage supply systems - Part 1: Principles, requirements and tests

This document does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

For relationships with other publications refer to the NSAI web store.

Compliance with this document does not of itself confer immunity from legal obligations.

In line with international standards practice the decimal point is shown as a comma (,) throughout this document.

This page is intentionally left blank

EUROPEAN STANDARD

EN IEC 60664-1

NORME EUROPÉENNE

EUROPÄISCHE NORM

July 2020

ICS 29.080.30

Supersedes EN 60664-1:2007 and all of its amendments
and corrigenda (if any)

English Version

**Insulation coordination for equipment within low-voltage supply
systems - Part 1: Principles, requirements and tests
(IEC 60664-1:2020)**

Coordination de l'isolement des matériels dans les réseaux
d'énergie électrique à basse tension - Partie 1: Principes,
exigences et essais
(IEC 60664-1:2020)

Isolationskoordination für elektrische Betriebsmittel in
Niederspannungsanlagen - Teil 1: Grundsätze,
Anforderungen und Prüfungen
(IEC 60664-1:2020)

This European Standard was approved by CENELEC on 2020-06-30. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

EN IEC 60664-1:2020 (E)**European foreword**

The text of document 109/183/FDIS, future edition 3 of IEC 60664-1, prepared by IEC/TC 109 "Insulation co-ordination for low-voltage equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60664-1:2020.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2021-03-30
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2023-06-30

This document supersedes EN 60664-1:2007 and all of its amendments and corrigenda (if any).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 60664-1:2020 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60038:2009	NOTE	Harmonized as EN 60038:2011 (modified)
IEC 60216 (series)	NOTE	Harmonized as EN 60216 (series)
IEC 60068 (series)	NOTE	Harmonized as EN 60068 (series)
IEC 60068-1:2013	NOTE	Harmonized as EN 60068-1:2014 (not modified)
IEC 60085:2007	NOTE	Harmonized as EN 60085:2008 (not modified)
IEC 60112:2003	NOTE	Harmonized as EN 60112:2003 (not modified)
IEC 60364-4-44:2007	NOTE	Harmonized as HD 60364-4-442:2012 (modified)
IEC 60529	NOTE	Harmonized as EN 60529
IEC 60664-3:2016	NOTE	Harmonized as EN 60664-3:2017 (not modified)
IEC 60664-4:2005	NOTE	Harmonized as EN 60664-4:2006 (not modified)
IEC 61000-4-5:2014	NOTE	Harmonized as EN 61000-4-5:2014 (not modified)

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60068-2-2	-	Environmental testing - Part 2-2: Tests - Test B: Dry heat	EN 60068-2-2	-
IEC 60068-2-14	2009	Environmental testing - Part 2-14: Tests - Test N: Change of temperature	EN 60068-2-14	2009
IEC 60068-2-78	-	Environmental testing - Part 2-78: Tests - Test Cab: Damp heat, steady state	EN 60068-2-78	-
IEC 60270	-	High-voltage test techniques - Partial discharge measurements	EN 60270	-
IEC 61140	2016	Protection against electric shock - Common aspects for installation and equipment	EN 61140	2016
IEC 61180	2016	High-voltage test techniques for low-voltage equipment - Definitions, test and procedure requirements, test equipment	EN 61180	2016

This page is intentionally left blank



IEC 60664-1

Edition 3.0 2020-05

INTERNATIONAL STANDARD

NORME INTERNATIONALE



BASIC SAFETY PUBLICATION

PUBLICATION FONDAMENTALE DE SÉCURITÉ

**Insulation coordination for equipment within low-voltage supply systems –
Part 1: Principles, requirements and tests**

**Coordination de l'isolement des matériels dans les réseaux d'énergie électrique
à basse tension –
Partie 1: Principes, exigences et essais**



THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2020 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,...). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

Electropedia - www.electropedia.org

The world's leading online dictionary on electrotechnology, containing more than 22 000 terminological entries in English and French, with equivalent terms in 16 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC Glossary - std.iec.ch/glossary

67 000 electrotechnical terminology entries in English and French extracted from the Terms and definitions clause of IEC publications issued between 2002 and 2015. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

A propos de l'IEC

La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications IEC

Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Recherche de publications IEC -

webstore.iec.ch/advsearchform

La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études,...). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

IEC Just Published - webstore.iec.ch/justpublished

Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et une fois par mois par email.

Service Clients - webstore.iec.ch/csc

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: sales@iec.ch.

Electropedia - www.electropedia.org

Le premier dictionnaire d'électrotechnologie en ligne au monde, avec plus de 22 000 articles terminologiques en anglais et en français, ainsi que les termes équivalents dans 16 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

Glossaire IEC - std.iec.ch/glossary

67 000 entrées terminologiques électrotechniques, en anglais et en français, extraites des articles Termes et définitions des publications IEC parues entre 2002 et 2015. Plus certaines entrées antérieures extraites des publications des CE 37, 77, 86 et CISPR de l'IEC.



IEC 60664-1

Edition 3.0 2020-05

INTERNATIONAL STANDARD

NORME INTERNATIONALE



BASIC SAFETY PUBLICATION

PUBLICATION FONDAMENTALE DE SÉCURITÉ

**Insulation coordination for equipment within low-voltage supply systems –
Part 1: Principles, requirements and tests**

**Coordination de l'isolement des matériels dans les réseaux d'énergie électrique
à basse tension –
Partie 1: Principes, exigences et essais**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 29.080.30

ISBN 978-2-8322-8287-8

**Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

CONTENTS

FOREWORD	6
1 Scope	8
2 Normative references	8
3 Terms, definitions and abbreviated terms	9
3.1 Terms and definitions	9
3.2 Abbreviated terms	15
4 Basic technical characteristics for insulation coordination	15
4.1 General	15
4.2 Voltages	16
4.2.1 General aspects	16
4.2.2 Transient overvoltages	17
4.2.3 Temporary overvoltages	18
4.2.4 Recurring peak voltage	18
4.2.5 Steady-state working voltage	19
4.2.6 Steady-state peak voltage	19
4.3 Overvoltage categories	19
4.3.1 General	19
4.3.2 Equipment energized directly from the mains supply	19
4.3.3 Systems and equipment not energized directly from the mains supply	20
4.4 Frequency	20
4.4.1 General	20
4.4.2 Solid insulation	20
4.5 Pollution	20
4.5.1 General	20
4.5.2 Degrees of pollution in the micro-environment	21
4.5.3 Conditions of conductive pollution	21
4.6 Insulating material	21
4.6.1 Solid insulation	21
4.6.2 Stresses	22
4.6.3 Comparative tracking index (CTI)	23
4.7 Environmental aspects	24
4.7.1 General	24
4.7.2 Altitude	24
4.7.3 Temperature	24
4.7.4 Vibrations	24
4.7.5 Humidity	24
4.8 Duration of voltage stress	24
4.9 Electrical field distribution	25
5 Design for insulation coordination	25
5.1 General	25
5.1.1 Means of insulation coordination	25
5.1.2 Frequency above 30 kHz	25
5.1.3 Reduced distances due to coating or potting	25
5.1.4 Equipment which are not connected to public low-voltage systems	25
5.2 Dimensioning of clearances	25
5.2.1 General	25

5.2.2	Dimensioning criteria for clearances	26
5.2.3	Other factors involving clearances	26
5.2.4	Dimensioning of clearances of functional insulation	27
5.2.5	Dimensioning of clearances of basic insulation, supplementary insulation and reinforced insulation.....	27
5.3	Dimensioning of creepage distances	28
5.3.1	General	28
5.3.2	Dimensioning criteria of creepage distances	29
5.3.3	Other factors involving creepage distances.....	30
5.3.4	Dimensioning of creepage distances of functional insulation	31
5.3.5	Dimensioning of creepage distances of basic insulation, supplementary insulation and reinforced insulation.....	31
5.4	Requirements for design of solid insulation	32
5.4.1	General	32
5.4.2	Voltage stress.....	32
5.4.3	Withstand of voltage stresses	32
5.4.4	Withstand on environmental stresses.....	34
6	Tests and measurements.....	34
6.1	General.....	34
6.2	Verification of clearances	35
6.2.1	General	35
6.2.2	Test voltages	35
6.3	Verification of creepage distances	37
6.4	Verification of solid insulation	37
6.4.1	General	37
6.4.2	Selection of tests	38
6.4.3	Conditioning	39
6.4.4	Impulse voltage test.....	39
6.4.5	AC power frequency voltage test	40
6.4.6	Partial discharge test.....	40
6.4.7	DC voltage test.....	42
6.4.8	High-frequency voltage test	43
6.5	Performing dielectric tests on complete equipment.....	43
6.5.1	General	43
6.5.2	Parts to be tested	43
6.5.3	Preparation of equipment circuits.....	44
6.5.4	Test voltage values.....	44
6.5.5	Test criteria	44
6.6	Other tests	44
6.6.1	Test for purposes other than insulation coordination	44
6.6.2	Sampling and routine tests	44
6.6.3	Measurement accuracy of test parameters.....	44
6.7	Measurement of the attenuation of the transient overvoltages.....	45
6.8	Measurement of clearances and creepage distances	45
Annex A (informative)	Basic data on withstand characteristics of clearances	51
Annex B (informative)	Nominal voltages of mains supply for different modes of overvoltage control	56
Annex C (normative)	Partial discharge test methods	58
C.1	Test circuits	58

C.1.1	General	58
C.1.2	Test circuit for earthed test specimen (Figure C.1).....	58
C.1.3	Test circuit for unearthed test specimen (Figure C.2).....	59
C.1.4	Selection criteria.....	59
C.1.5	Measuring impedance.....	59
C.1.6	Coupling capacitor C_k	59
C.1.7	Filter.....	59
C.2	Test parameters.....	59
C.2.1	General	59
C.2.2	Requirements for the test voltage	60
C.2.3	Climatic conditions	60
C.3	Requirements for measuring instruments	60
C.3.1	General	60
C.3.2	Classification of PD meters.....	60
C.3.3	Bandwidth of the test circuit.....	61
C.4	Calibration	61
C.4.1	Calibration of discharge magnitude before the noise level measurement	61
C.4.2	Verification of the noise level.....	62
C.4.3	Calibration for the PD test	63
C.4.4	Calibration pulse generator.....	63
Annex D (informative)	Additional information on partial discharge test methods	64
D.1	Measurement of partial discharge (PD), PD inception and extinction voltage.....	64
D.2	Description of PD test circuits (Figure D.1)	64
D.3	Precautions for reduction of noise.....	65
D.3.1	General	65
D.3.2	Sources in the non-energized test circuit	65
D.3.3	Sources in the energized test circuit	65
D.3.4	Measures for reduction of noise.....	65
D.4	Application of multiplying factors for test voltages	65
D.4.1	General	65
D.4.2	Example 1 (circuit connected to mains supply).....	66
D.4.3	Example 2 (internal circuit with maximum recurring peak voltage U_{rp}).....	66
Annex E (informative)	Comparison of creepage distances specified in Table F.5 and clearances in Table A.1	67
Annex F (normative)	Tables	68
Annex G (informative)	Determination of clearance distances according to 5.2.....	77
Annex H (informative)	Determination of creepage distances according to 5.3.....	79
Bibliography	81
Figure 1	– Recurring peak voltage	19
Figure 2	– Determination of the width (W) and height (H) of a rib	31
Figure 3	– Test voltages	42
Figure 4	– Across the groove	46
Figure 5	– Contour of the groove	47
Figure 6	– Contour of the groove with angle.....	47
Figure 7	– Contour of rib.....	47
Figure 8	– Uncemented joint with grooves less than X	48

Figure 9 – Uncemented joint with grooves equal to or more than X	48
Figure 10 – Uncemented joint with a groove on one side less than X	49
Figure 11 – Creepage distance and clearance through an uncemented joint	49
Figure 12 – Creepage distance and clearance to a head of screw more than X	49
Figure 13 – Creepage distance and clearance to a head of screw less than X	50
Figure 14 – Creepage distance and clearance with conductive floating part	50
Figure A.1 – Withstand voltage at 2 000 m above sea level	53
Figure A.2 – Experimental data measured at approximately sea level and their low limits for inhomogeneous field	54
Figure A.3 – Experimental data measured at approximately sea level and their low limits for homogeneous field	55
Figure C.1 – Earthed test specimen	58
Figure C.2 – Unearthed test specimen	59
Figure C.3 – Calibration for earthed test specimen	62
Figure C.4 – Calibration for unearthed test specimen	62
Figure D.1 – Partial discharge test circuits	64
Figure E.1 – Comparison between creepage distances specified in Table F.5 and clearances in Table A.1	67
Figure G.1 – Determination of clearance distances according to 5.2 (1 of 2)	77
Figure H.1 – Determination of creepage distances according to 5.3 (1 of 2)	79
Table 1 – Dimensioning of grooves	46
Table A.1 – Withstand voltages for an altitude of 2 000 m above sea level (1 of 2)	51
Table A.2 – Altitude correction factors for clearance correction	52
Table B.1 – Inherent control or equivalent protective control	56
Table B.2 – Cases where protective control is necessary and control is provided by surge protective device having a ratio of voltage protection level to rated voltage not smaller than that specified in IEC 61643 (all parts)	57
Table F.1 – Rated impulse withstand voltage for equipment energized directly from the mains supply	68
Table F.2 – Clearances to withstand transient overvoltages	69
Table F.3 – Single-phase three-wire or two-wire AC or DC systems	70
Table F.4 – Three-phase four-wire or three-wire AC systems	71
Table F.5 – Creepage distances to avoid failure due to tracking (1 of 2)	72
Table F.6 – Test voltages for verifying clearances only at different altitudes	74
Table F.7 – Severities for conditioning of solid insulation	74
Table F.8 – Dimensioning of clearances to withstand steady-state peak voltages, temporary overvoltages or recurring peak voltages ^b	75
Table F.9 – Additional information concerning the dimensioning of clearances to avoid partial discharge	75
Table F.10 – Altitude correction factors for clearance correction	76

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**INSULATION COORDINATION FOR EQUIPMENT
WITHIN LOW-VOLTAGE SUPPLY SYSTEMS –****Part 1: Principles, requirements and tests**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as “IEC Publication(s)”). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60664-1 has been prepared by IEC technical committee 109: Insulation co-ordination for low-voltage equipment.

This third edition cancels and replaces the second edition published in 2007. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) update of the Scope, Clauses 2 and 3,
- b) new structure for Clauses 4 and 5,
- c) addition of 1 500 V DC into tables in Annex B and F,
- d) update of distances altitude correction in a new Table F.10,
- e) addition of Annex G with a flowchart for clearances,

f) addition of Annex H with a flowchart for creepage distances.

It has the status of a basic safety publication in accordance with IEC Guide 104.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
109/183/FDIS	109/186/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 60664 series, published under the general title *Insulation coordination for equipment within low-voltage supply systems*, can be found on the IEC website.

Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

In this document, the following print type is used:

– **Terms defined in Clause 3: in bold type.**

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INSULATION COORDINATION FOR EQUIPMENT WITHIN LOW-VOLTAGE SUPPLY SYSTEMS –

Part 1: Principles, requirements and tests

1 Scope

This part of IEC 60664 deals with **insulation coordination** for equipment having a **rated voltage** up to AC 1 000 V or DC 1 500 V connected to **low-voltage supply systems**.

This document applies to frequencies up to 30 kHz.

NOTE 1 Requirements for **insulation coordination** for equipment within **low-voltage supply systems** with rated frequencies above 30 kHz are given in IEC 60664-4.

NOTE 2 Higher voltages can exist in internal circuits of the equipment.

It applies to equipment for use up to 2 000 m above sea level and provides guidance for use at higher altitudes (See 5.2.3.4).

It provides requirements for technical committees to determine **clearances**, **creepage distances** and criteria for **solid insulation**. It includes methods of electrical testing with respect to **insulation coordination**.

The minimum **clearances** specified in this document do not apply where ionized gases are present. Special requirements for such situations can be specified at the discretion of the relevant technical committee.

This document does not deal with distances:

- through liquid insulation;
- through gases other than air;
- through compressed air.

This basic safety publication focusing on safety essential requirements is primarily intended for use by technical committees in the preparation of standards in accordance with the principles laid down in IEC Guide 104 and ISO/IEC Guide 51.

One of the responsibilities of a technical committee is, wherever applicable, to make use of basic safety publications in the preparation of its publications.

However, in case of missing specified values for **clearances**, **creepage distances** and requirements for **solid insulation** in the relevant product standards, or even missing standards, this document applies.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60068-2-2, *Environmental testing – Part 2-2: Tests – Tests B: Dry heat*

This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

-
- [Looking for additional Standards? Visit Intertek Inform Infostore](#)
 - [Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation](#)
-